

Abstract:

A multilayer structure in which all the magnetic elements have the windings edged in the inner layers and the magnetic core which surrounds the winding has the legs penetrating through the multilayer structure. The interconnection between the magnetic elements and the rest of electronic components is done through the layers of the multilayer board, horizontally and vertically through via. For higher power components special cuts are performed in the multilayer board to accommodate the body of the components which may be connected to an external heatsink. The winding arrangement in the transformer is done in a such way to minimize and even eliminate the common mode noise injected through the capacitance between primary and secondary winding. The input filter is constructed to exhibit a differential and a common mode impedance. Supplementary capacitors are incorporated in the multilayers structure to offer a low impedance to the noise to short it to the source, or for injecting currents of opposite polarity to cancel the common mode current transferred through the transformer's inter winding capacitance and through the parasitic capacitance of the switching elements to the secondary. The insulation between winding can be in accordance with the safety agency requirements, allowing much shorter creepage distances inside of the multilayer PCB structure than in the air due to the compliance with coating environment.